

### NEGLIGENCE.

Your Commissioner cannot find, on the evidence, that these fires, or any of them, can be attributed to the negligence of any person.

The fire at Whangamarino, by which the wattle plantation was damaged, traversed an impassable swamp. The vegetation in this swamp near the railway-line could not have been cleared without great expense to the department, if at all. The fires at Papatoitoi started on the claimant's own land, and do not appear to have spread from any dried vegetation beside the railway-line. That at Rakaia began in some dried grass gathered into heaps by the lessee, making hay. Unless by consent of the lessee, the department's officers could not have removed such grass. The fire at Hinds may not have commenced on the railway-line, but in the plantation adjoining it.

### PRECAUTIONS TAKEN TO PREVENT FIRES.

The regulations bearing on the prevention of fires are very complete. All those employed in maintaining the lines are enjoined to remove or burn any inflammable material therefrom, in order to minimise the risk of fire spreading from the line. These precautions appear to be generally observed. Fires are to be at once reported, on a form supplied for that purpose; and every assistance must be given by those in the employment of the department in extinguishing fires near the line.

### APPLIANCES IN USE.

There are only two kinds of spark-arresters in use on the New Zealand railways. One kind is used when burning hard coal, and the other when soft coal is being burnt. That for the hard coal is a perforated plate through which all the smoke and gases, after passing through the boiler-tubes, are forced, before entering the engine-chimney. The openings in this plate are  $\frac{3}{8}$  in. by  $\frac{1}{8}$  in.

The best-known appliances are used in the furnaces to insure complete combustion of the coal. In all the locomotives the ashes fall through a perforated plate at the bottom of the furnace, and are then flooded with water to extinguish the embers. When soft coal is used, the blast does not force the smoke through a perforated plate. The aim is then to break up the soft, spongy masses of carbon, of which the sparks are composed, by driving them with great velocity against an obstruction. It has been found impracticable to use a perforated plate or sieve with soft coal or lignite. The obstruction against which the particles are driven is placed near the top of the funnel. The particles strike against it, or are supposed to do so, and by the impact are broken. Some of the larger pieces fall back, and are again shot upwards and further broken until they are either consumed by the oxygen of the air or are reduced to such a state of fineness that they are incapable of doing any damage. Notwithstanding such appliances sparks do escape, but these are the best-known arrangements for preventing them. On some of the Continental and British railways, when hard coal is burnt, no arrester is used. It is considered that there is little risk of fire, the hard coal not giving forth sparks to any extent.

There is a natural antagonism between spark-arresting appliances and effective work on a locomotive. All such interfere more or less with the draught, and hence diminish the efficiency of the locomotive.

Two of the witnesses in Auckland instituted a comparison between a locomotive and other engines, and contended that as it was possible to prevent sparks from the engines used for threshing purposes, so that it could be safely placed between stacks of straw; and, further, that as traction-engines did not emit sparks, therefore locomotives could with care be stopped from throwing them. The reasoning is not sound. The enormously greater work to be done by a locomotive necessitates a much more powerful blast, and what would be effective to prevent sparks in one class of engine would not do in the other. The addition of a foot or two to the chimney would not affect a spark that had already passed through the perforated plate or survived the battering process of the deflector; nor would the placing of a net on the top of the funnel be sufficient. It is immaterial whether placed on the top or near the bottom, as is done in the use of the perforated plate; and it has been found by one of these two witnesses that soft coal cannot be safely burnt in a threshing-machine, even with a net on the top of the funnel.

The appliances used on the New Zealand railways for preventing sparks are equal to if not superior to any used on the principal railway systems of the world. They are inspected daily, and any defect has to be at once reported.